

WHAT IS CLAIMED IS:

1. A packet transmitting/receiving method for a computer system in which a plurality of packet transmitting/receiving units provided in correspondence 5 to external modules are connected via a packet bus,

in which each of said packet transmitting/receiving units is constructed in such a manner that

when a packet received from said external module 10 is transmitted, in the case where a transmitting request is issued to a transmission destination and a transmission permission is obtained, said packet is transmitted, and in the case where the transmission permission is not obtained, said transmission packet is stored in a buffer and said unit is set into a transfer 15 waiting state, and

when the transmitting request of the packet is received from another packet transmitting/receiving unit, if said unit is in a packet receivable state, a response of the transmission permission is made and the packet is received, and if said unit is in a packet unreceivable state, the response of the transmission permission is inhibited,

wherein priorities are set in order of an internal 25 register access packet, a response system packet, and a command system packet which are transmitted/received by said packet transmitting/receiving unit, and

in the transfer waiting state of said command system packet of the low priority to a certain transmission destination, in the case where the response system packet of the high priority to another 5 transmission destination is received from the external module, said packet transmitting/receiving unit withdraws said transfer waiting state and transmits the response system packet of the high priority.

- 10     2. A packet transmitting/receiving method for a computer system in which a plurality of packet transmitting/receiving units provided in correspondence to external modules are connected via a packet bus, in which each of said packet 15 transmitting/receiving units is constructed in such a manner that when a packet received from said external module is transmitted, in the case where a transmitting request is issued and a transmission permission is 20 obtained from a destination of said transmission, said packet is transmitted, and in the case where the transmission permission is not obtained, said transmission packet is stored in a buffer and said unit is set into a transfer waiting state, and 25 when the transmitting request of the packet is received from another packet transmitting/receiving unit, if said unit is in a packet receivable state, a

response of the transmission permission is made and the packet is received, and if said unit is in a packet unreceivable state, the response of the transmission permission is inhibited,

5       wherein priorities are set in order of an internal register access packet, a response system packet, and a command system packet which are transmitted/received by said packet transmitting/receiving unit,

10      in the transfer waiting state of said command system packet of the low priority to a certain transmission destination, in the case where the internal register access packet of the highest priority to the same transmission destination is received from the external module, said packet transmitting/receiving unit withdraws said transfer waiting state and transmits the internal register access packet of the highest priority, and

15      in a response inhibiting state of the transmission permission caused by an error of the external module,  
20      in the case where the transmitting request of the internal register access packet of the highest priority is received, said packet transmitting/receiving unit on the transmission destination side makes a response of the transmission permission, receives the internal register access packet, and returns an error detail  
25      information packet showing an error state of the external module.

3. A method according to claim 2, wherein in the response inhibiting state of the transmission permission caused by the error of the external module, after the packet transmitting request is received, in  
5 the case where said packet transmitting request is withdrawn and the packet transmitting request is subsequently again issued, said packet transmitting/receiving unit on said transmission destination side determines that said request is the  
10 transmitting request of said internal register access packet of the highest priority and makes a response of the transmission permission.

4. A packet transmitting/receiving method in which a plurality of packet transmitting/receiving units provided in correspondence to external modules are connected via a packet bus,  
15 in which each of said packet transmitting/receiving units is constructed in such a manner that  
when a packet received from said external module is transmitted, in the case where a transmitting request is issued and a transmission permission is obtained from a destination of said transmission, said  
20 packet is transmitted, and in the case where the transmission permission is not obtained, said transmission packet is stored in a buffer and said unit  
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is set into a transfer waiting state, and

when the transmitting request of the packet is received from another packet transmitting/receiving unit, if said unit is in a packet receivable state, a response of the transmission permission is made and the packet is received, and if said unit is in a packet unreceivable state, the response of the transmission permission is inhibited,

wherein priorities are set in accordance with kinds of packets which are transmitted/received by said packet transmitting/receiving unit, and

in the transfer waiting state of the packet of the low priority to a certain transmission destination, in the case where the packet of the high priority to another transmission destination is received from the external module, said packet transmitting/receiving unit withdraws said transfer waiting state and transmits the packet of the high priority.

5. A packet transmitting/receiving method for a computer system in which a plurality of packet transmitting/receiving units provided in correspondence to external modules are connected via a packet bus,

in which each of said packet transmitting/receiving units is constructed in such a manner that

when a packet received from said external module

is transmitted, in the case where a transmitting request is issued and a transmission permission is obtained from a destination of said transmission, said packet is transmitted, and in the case where the  
5 transmission permission is not obtained, said transmission packet is stored in a buffer and said unit is set into a transfer waiting state, and

when the transmitting request of the packet is received from another packet transmitting/receiving  
10 unit, if said unit is in a packet receivable state, a response of the transmission permission is made and the packet is received, and if said unit is in a packet unreceivable state, the response of the transmission permission is inhibited,

15 wherein priorities are set in accordance with kinds of packets which are transmitted/received by said packet transmitting/receiving unit,

in the transfer waiting state of the packet to a certain transmission destination, in the case where the  
20 packet of the highest priority to the same transmission destination is received from the external module, said packet transmitting/receiving unit withdraws said transfer waiting state and transmits the packet of the highest priority, and

25 in a response inhibiting state of the transmission permission caused by an error of the external module, in the case where the transmitting request of the

packet of the highest priority is received, said packet transmitting/receiving unit on the transmission destination side makes a response of the transmission permission, receives the packet, and returns an error detail information packet of the external module.

6. A method according to claim 5, wherein in the response inhibiting state of the transmission permission caused by the error of the external module, after the packet transmitting request is received, in the case where said packet transmitting request is withdrawn and the packet transmitting request is subsequently again issued, said packet transmitting/receiving unit on said transmission destination side determines that the request is the transmitting request of the packet of the highest priority and makes a response of the transmission permission.

7. A packet transmitting/receiving apparatus for a computer system, wherein a plurality of packet transmitting/receiving units provided in correspondence to external modules are connected via a packet bus, and each of said packet transmitting/receiving units comprises:
- a packet transmitting function unit for, when a

packet received from said external module is transmitted, in the case where a transmitting request is issued to a transmission destination and a transmission permission is obtained, transmitting said

5 packet, and in the case where the transmission permission is not obtained, for storing said transmission packet into a buffer and setting said unit into a transfer waiting state; and

a packet receiving function unit for, when a  
10 transmitting request of the packet is received, making a response of the transmission permission in the case where said unit is in a packet receivable state, receiving the packet, and inhibiting the response of the transmission permission in the case where said unit  
15 is in a packet unreceivable state,

and further said packet transmitting function unit comprises:

a packet priority discriminating unit for discriminating priorities determined in order of an  
20 internal register access packet, a response system packet, and a command system packet which are received from the external module and storing said packets into different buffers; and

a packet transmitting request arbiter for, in the  
25 transfer waiting state of said command system packet of the low priority to a certain transmission destination, in the case where the response system packet of the

high priority to another transmission destination is received from the external module, withdrawing said transfer waiting state and transmitting the response system packet of the high priority.

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8. A packet transmitting/receiving apparatus for a computer system,

wherein a plurality of packet transmitting/receiving units provided in correspondence 10 to external modules are connected via a packet bus, and each of said packet transmitting/receiving units comprises:

a packet transmitting function unit for, when a packet received from said external module is transmitted, in the case where a transmitting request 15 is issued and a transmission permission is obtained from a transmission destination, transmitting said packet, and in the case where the transmission permission is not obtained, for storing said 20 transmission packet into a buffer and setting said unit into a transfer waiting state, and

a packet receiving function unit for, when a transmitting request is received from another packet transmitting/receiving unit, making a response of the 25 transmission permission in the case where said unit is in a packet receivable state, receiving the packet, and stopping the response of the transmission permission in

the case where said unit is in a packet unreceivable state,

and further said packet transmitting function unit comprises:

5           a transmission packet priority discriminating unit for discriminating priorities determined in order of an internal register access packet, a response system packet, and a command system packet received from the other packet transmitting/receiving unit and storing

10          said packets into different buffers; and

              a packet transmitting requesting arbiter for, in the transfer waiting state of the command system packet of the low priority to a certain transmission destination, in the case where the internal register

15          access packet of the highest priority to another transmission destination is received from the external module, withdrawing said transfer waiting state and transmitting the response system packet of the high priority, and

20          said packet receiving function unit comprises:

              a reception packet priority discriminating unit for discriminating the priorities determined in order of said internal register access packet, response system packet, and command system packet received from the other packet transmitting/receiving unit and for storing said packets into the different buffers; and

              a packet receiving request arbiter for, in a

response inhibiting state of said transmission permission caused by an error of the external module, only in the case where the transmitting request of said internal register access packet of the highest priority  
5 is received, making a response of the transmission permission, receiving the internal register access packet, and returning error detail information packet showing an error state of the external module.

- 10 9. An apparatus according to claim 8, wherein in the response inhibiting state of said transmission permission caused by the error of the external module, after a packet transmitting request is received from the other transmitting/receiving module, in the case  
15 where said packet transmitting request is withdrawn and the packet transmitting request is subsequently again issued, said packet receiving request arbiter determines that said request is the transmitting request of said internal register access packet of the  
20 highest priority, and makes a response of the transmission permission.
10. An apparatus according to claim 7, wherein said external module is a PCI bridge module for performing a  
25 conversion between a command on a PCI bus and the packet.

11. An apparatus according to claim 10, wherein  
modules such as host, input/output devices, memory, and  
the like are connected to the PCI bus of said PCI  
bridge module through a PCI module.

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